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BIRD-CATCHING IN HELIGOLAND.

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THE island of Heligoland lies in the same latitude and two hundred and eighty-five miles east of Flamborough Head, forty miles from Cuxhaven and the mouth of the Elbe, and thirty from the coast of Sleswick-Holstein. Until its cession to Germany in 1890 it was the smallest dependency of the British crown. In case of a European war the island never could have been valuable to England, but on the other hand, its possession is an immense advantage to Germany, serving as a marine outpost to watch the entrances to the Elbe and Weser. When under the English rule, half-a-dozen coastguards did duty as garrison; now large barracks have been erected on the Oberland, and the plateau bristles with heavy guns.

The main island is one mile in length and two-thirds of a mile broad, with an area of about one hundred acres. The superficial extent may be estimated when we say it would be impossible to find room anywhere on the Oberland for a cricket pitch without the risk of an occasional far-driven ball skipping over the edge of the high cliffs of red sandstone into the sea. Some portion of the Oberland, or plateau, is covered with houses and very charming gardens, but the main town is below the cliff on the beach or Unterland. The population is about two thousand, with the addition of another two thousand visitors for the sea-bathing in the summer months. There is no cow on Heligoland, and up to the German occupation no horse had ever been seen there. So great, indeed, was the sensation amongst the primitive people when the Prussian engineers brought over some dray-horses to shift their big guns, that the school children, on the mere rumour of their landing, became unmanageable and broke away 'helter-skelter' to see the marvellous beasts. The produce of the island chiefly consists of potatoes grown on the Oberland, and some

small plots of rye and barley, and there is grazing for a few tethered goats.

The great interest of Heligoland consists in the fact that it is, from an ornithological point of view, literally without a rival in the world. For its sea-girt cliffs lie directly in the line of the great migratory stream of countless birds which in the autumn pass from their northern breeding stations to seek the lands of the deathless summer, again to commence their journey northwards with the first breath of early spring. This bird movement in its flow and ebb assumes enormous proportions, and is continued from day to day, week to week, and month after month, so that with the exception perhaps of June, between the ebb and flow, there is no other month in the year when birds are not, with favourable meteorologic conditions, on the move.

It may be readily understood then that, on a beffless and muttonless island, where every necessity and luxury must be brought from the mainland, what an immense importance to the islanders becomes the capture of the migrating birds which pass that way. And certainly we can testify in no other spot in the world is more attention given, or more ingenuity displayed, in the outwitting of the feathered hosts—guns, nets, snares, gins, catapults, and all possible devices, being brought into play. Fortunately for our knowledge of Heligoland and its bird wonders, there has been resident there for more than half a century one of the most eminent and painstaking naturalists in Europe—Heinrich Gätke; and in 1891 his great work on the *Birds of Heligoland* was brought out in German at Brunswick. This was subsequently followed in 1895 by the English edition,* which may fairly be considered the most important contribution in the present century to our knowledge of the path of the bird in the air. It is

* *Heligoland as an Ornithological Observatory: The Results of Fifty Years' Experience*, by Heinrich Gätke. Translated by Rudolph Rosenstock, M.A., Oxon. (Edinburgh: David Douglas, 10 Castle Street, 1895.)

from this splendid work and our own personal knowledge of the island that the materials have been brought together for this paper.

Some idea may be formed of the marvellous number of birds occasionally captured, from the fact, which Mr Gätke permitted me to copy from his journal on my first visit there, that on the evening of November 6, 1868, at the lighthouse up to 9.30 P.M. three thousand four hundred larks were caught beating and fluttering against the glass of the lantern; of these Mr Gätke himself took four hundred and forty with his own hand. The same evening, and in the same time, eleven thousand six hundred were taken with nets, lanterns, &c., within the zone of light below the lighthouse. A grand total of fifteen thousand larks in a few hours!

Much the largest number of captures, more especially of the thrushes, are made with a contrivance known as a 'trossel-goard'—literally a 'throstle-garden.' 'Throstle-bush' is more applicable to the structure, but there is no word in the Heligoland vocabulary to represent 'bush'—every form of growth, from the forest tree to a plant in a pot is 'boamen,' that is, trees. There are about twenty of these throstle bushes on the island. These may be either natural or artificial. The first, a slip or narrow belt of thorns and other shrubs growing in a garden. Usually, however, they are artificially constructed with a mass of thorns and sticks placed upright. At the highest and most open and exposed part of the island I once examined six of these constructions, a collection of thorns, bushes, and long sticks, ten to twelve feet high and perpendicular in front, and those in the rear inclined to them at an angle enclosing a space of brushwood with a twenty-foot front and six to eight feet wide at the base, gradually thinning off to the top. The east side, from which the birds come, is left open; the far side, top and flanks, is covered with a light net which extends to within a foot of the ground, and is there fastened to small upright stakes; from these extends horizontally the ground-net, forming an extensive semicircle round the far sides and flanks of the bush, and gradually nearing the surface till it rests loosely on the soil, six feet from the base of the construction. It is essential that 'throstle-gardens' should be visible to migrants at some distance, and that there is nothing which might impede the headlong rush of the birds towards the open and unnetted side.

Mr Gätke says, the arrival of the thrushes at early dawn is marked by a peculiar buzzing sound; the birds shooting down from a great height with an almost perpendicular descent, and so extremely rapid is this downrush that it only becomes visible to the eye as the birds slacken speed near the ground. During a strong migration, thrushes at early dawn will

'buzz,' with the speed of an arrow, through the narrow streets and precipitate themselves into the shrubs and throstle bushes. The greatest speed of the birds during the day is as nothing when compared to this early morning flight, which probably represents the last spurt of the migratory journey. Once within the false shelter of the throstle-bush, and the capture of the unfortunate victims is assured. They are driven forward by the beating of a stick, and at night by the additional glare of a large lantern, and finding egress barred on the far side, flutter downwards to pass beneath the horizontal ground-net from which there is no escape. These shelter-decoys are very effective, and immense numbers of migrants—even gray crows, sparrow-hawks, woodcocks, and often owls—are captured from time to time.

The Heligolandish fowlers draw a marked distinction between the habits of the blackbird and thrush. They say of the former, 'a very sensible bird which allows itself to be driven to the throstle-bush without much fuss.' A blackbird when on the ground, on being approached, will hop towards a throstle-bush, quickly in long leaps and frequent pauses; on the other hand, a thrush will sit still and at last fly vertically upwards and over the bush. The capture of thrushes was formerly a very lucrative employment, but in recent years (Mr Gätke thinks through meteorological changes) the take has greatly fallen off. Formerly a well-known fowler used to catch five or six hundred in a day, and once he caught a thousand in a day. At the present time a hundred is considered a good take.

The ring-ousel is always a great prize amongst the local fowlers, for they are invariably fat and in high condition during the autumn migration. Should a single ring-ousel get into the throstle-bush, its call will lure the members of any flock of its species which may be on the wing. On one occasion it was the good fortune of a fowler to take seventy-three of these splendid birds in one 'rush.' Usually ten or twelve would be considered an enviable catch.

The redwing is rarely taken in a 'throstle-bush,' seldom approaching one, the flocks resorting to more open situations. The same applies to the fieldfare, which only enters the bush under very exceptional circumstances, as when belated at night.

To Heligoland gunners the woodcock is an object of the greatest interest, and during his migration all other fowl are neglected. Woodcocks cross Heligoland in great numbers in the spring and autumn—and in the latter season, when woodcock are in flight, in the early gray of morning, the constant pop-pop of guns at the foot of the cliffs resembles a line of skirmishers defending their island home. It is on record that on the 21st of October

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1823 the number caught and shot exceeded eleven hundred; eighty-three falling to one gun, and a certain Hans Prohl shot ninety-nine, failing to bring down his hundredth bird. When mentioning these exploits, it must be borne in mind that the guns used in those days by the Heligoland gunners were ancient infantry, flint and steel muskets fished up, after months of submergence in salt water, from the wreck of a Dutch vessel—the bowl of a clay-pipe being measure for both powder and shot. On October 16, 1861, about six hundred woodcocks were caught or shot, and bags of from two to three hundred have frequently been known for one day's shooting. Once in the spring, on a Good-Friday, seventy-four were shot by a young pilot.

Woodcocks have occasionally been taken in 'throstle-bushes,' and many are snared in large nets specially constructed for that purpose. These nets are from thirty-six to seventy-two feet in length, and twenty-four feet high, with two and a half inch mesh, so that a cock in full flight may readily get his head and neck through. The nets are made of strong gray thread, and hung on two poles in some opening between trees or buildings; there are two running blocks and a cord which the fowler holds; the net is weighted heavily at its upper corners to make it fall readily; and when a bird strikes, the net is instantly slippe¹, and it rarely happens the victim escapes. On the 15th of October 1859, a considerable flight of that small and pretty northern owl, called Tengmaln's owl, visited the island, and in hopes of capturing specimens, a woodcock net was hoisted in the dusk, but these owls fly so cautiously and see so keenly that the device was useless. There are ten or twelve woodcock nets in use on the island, on each of which is a tax of five marks.

Woodcocks on migration not only settle on the bare level upper plateau, but great numbers on the shingle at the base of the cliffs, and on ledges and slight projections at all heights on the cliff face. The story is told of a gunner, who, getting the heads of two woodcocks in line on the lower rocks, discharged his piece and found to his great joy he had killed four. Golden and grayplover are shot crossing the upper plateau and also on the Dune or Sand Island, being lured within shot without difficulty by the plover whistle.

In the early autumn enormous numbers of wheatears arrive on their passage south. The first—and this holds good amongst all the migrants—are young birds of the year. This last autumn in September the plateau was covered with these lively little visitors, or the remains of such as had been killed by hungry hawks on passage at the same time. The wheatears are caught in great numbers for the tables of the visitors who come for sea-bathing. A simple draw-net is employed. A small hillock being first erected five feet long and eight to ten inches high—parallel to this the

net is placed, and by means of a line jerked over the hillock. Sometimes a colony of ants is introduced into the mound and forms an excellent bait. During a very strong migration the produce of a net may amount to five or ten score. On perfectly dark gloomy nights, when there is a heavy migration of larks and other migrants flying low near the surface, the whole island is astir, men and boys sallying forth with lanterns and a sort of big landing-net. As soon, however, as the very faintest indication of light appears from the rising moon, or a single star pierces the gloom, the vast migration flight ceases, the birds rising and passing forward at a high altitude.

There are other simpler means of fowling than any we have mentioned. On a pitch-dark night, moonless and starless, a man armed only with a stick and a large lantern will go forth on the plateau, traversing to and fro in the hope of being able to knock some belated wayfarers on the head, and by this means replenish his soup pot. Out of the millions of gray crows which in the autumn cross Heligoland by an east to west route, few ever remain the night, but it will sometimes happen that a late flock, not caring to face the darkness, after flying two or three times round the plateau, will alight and stay the night. I have a note that on October 14, 1887, a Heligolander went to the north point of the island with lantern and cudgel, and killed seventy-five hooded crows roosting on the grass. Mr Gätke mentions a case where a resident killed one hundred and eighty-four of these rascals in the same manner.

What do the Heligolandiers do with their birds? Some are sent away to the Hamburg market, and the rest kept for home consumption. Roasting before a slow fire, with the trail on, over toast, is practically an unknown art, or at least one rarely practised. Everything goes into the pot for soup. 'Trossel-soup' is an institution much lauded. Mr Gätke tells us how it should be prepared. Take care to commit some forty or fifty thrushes, according to the requirements of the family, to the soup pot, and do not have the fattest birds drawn; and if the cook is a true artist, no one will fail to ask a second helping. A favourite Heligoland dish is Kittiwake pie. In November and December these gulls are very fat, and when prepared in Heligolandish fashion are considered a delicacy, although a somewhat fishy one. The gray crow is also a very favourite dish. Nothing strikes a visitor to the island in autumn more than the astonishing number of gray crows which pass over between the end of September and the close of November by an east to west route. A mere fraction of these vast hosts remain to winter in our eastern counties, but where do the remainder go? And more wonderful: Where do they all come from? Drawn together by some mysterious instinct from the confines of Europe and beyond? On the night of October 17th, or early morning of the 18th, last autumn, there was a large arrival on the east coast of Lincolnshire; and I noticed amongst these many having the pale slate-gray almost white, or very much lighter than the ordinary

crow immigrants. This was suggestive of an arrival from beyond the Urals from Western Siberia, and perhaps even the western boundary of Persia.

THE MASTER CRAFTSMAN.*

CHAPTER XL.—LOVE, THE TRAITOR.

It was that way began the companionship that has changed the whole of my life and Isabel's life as well—you shall hear how.

My lessons in the study of Nature and Humanity were continued during the months of June and July. On Saturdays we went afield—to Hampton, to Richmond, to Dulwich, to Sydenham, to Loughton, to Chigwell, to Theydon Bois, to Chingford, to St Albans—wherever there are trees and gardens to be seen. Or we went up the river to Maidenhead, Bray, Windsor, Weybridge: or down the river to Greenwich. On Sunday morning I took her generally to Westminster, where she heard the silver voices of the choir ringing in the roof, while we sat in a corner of the transept beside the tombs. At such a time I would watch her and mark how her spirit was rapt and carried away. When the music ceased, we would get up and go out and seek the peaceful cloister, cool and shady, on the south side of the church, and there sit together, mostly in silence.

Let me make a clean breast of it. Not that I am penitent, but quite the contrary. I ought, I suppose, to have discontinued these little expeditions as soon as I learned what was coming out of them. That would be the line adopted by the Sage of seventy springs. I had only five-and-twenty. Moreover, it is very difficult to say when friendship is transformed into love: the young man goes on: the companionship, always delightful, becomes too delightful to give up: the companion creeps into his heart and remains there until one day he awakes to the consciousness that life without that companion will henceforth be intolerable.

But we entered upon the thing loyally: we had no thought of any danger: then, no one interfered with us: we went where we pleased. I began with thinking about Isabel when I ought to have been considering the lines of a boat: I began to think how she looked: what she said: her face haunted me: her sweet soft face, full of purity, grace, and every womanly virtue: her eyes, her deep and limpid eyes, wells of holy thoughts, charged with goodness: her voice—the tones of her voice—which had become to me the sweetest music in the world. I dreamed of these things at night—I thought of them all day: long before I understood what had happened to me: long before Isabel suspected anything. The last thing indeed which the maiden feared or suspected was the thing that happened. She was engaged to Robert: and I was Robert's cousin: and by Robert's permission I was showing her the world. Even a girl who knows the ways of the world, and especially the treacherous, villainous, deceptive ways of young men, and would be therefore

suspicious in such a case, might have thought that there was some security in common loyalty and friendship. But Isabel had no knowledge of the world, and no experience of young men, and consequently no suspicion.

The end—I mean the end of unsuspecting confidence—arrived unexpectedly. It came one evening, about the middle of July and at sunset. We were sitting in the place where I had taken Isabel first, the park near Rickmansworth. She sang hymns no more: nor did she faint at beholding the splendour and the glory of the world; but she sat in silence, gazing upon the western glow in the sky and on the flowing river at her feet where the glow was reflected.

Could this glorious creature be the pale and drooping maiden whom I brought here six weeks before? Now she sat upright, cheeks glowing, eyes uplifted, limpid and lovely eyes, with rounded figure and head erect, a girl full of life and of the joy of youth.

'The summer is nearly gone,' she said. 'So there is no need for any more evenings abroad. Now I suppose I must make up my mind to go back to Wapping, and to stay there. Well, I have a very happy time to remember.'

'Indeed, you shall not, Isabel, if I can help it. Go back to the old life? Not if I have any voice in the matter. Besides, the clouds are not all gone. There is one that falls on you quite suddenly, and sometimes lies upon you for an hour or more. Why, it has fallen now. You cloud over suddenly, Isabel. It is some thought that comes to you uninvited. Your face must be all sunshine or all cloud. Never was such a tell-tale face.'

She blushed, but the cloud lay there still.

'What is it, Isabel? What is this cloud? Is it anything that I can remove?'

'No one can remove it,' she said.

'Is it anything—but I have no right to ask. Only, Isabel, if you like to tell me, I might advise.'

She remained silent, but the tears gathered in her eyes.

'Tell me, Isabel,' I pressed her. 'I asked you once before in the old burial-ground.'

'I do not dare. I am ashamed. You will think me the most ungrateful of women if I tell you.'

'Then tell me and let me scold you.'

'It is because of that promise.'

Then the scales fell from my eyes, and I understood the cloud. It was the terror of that promise. 'And you, Isabel, you do not want to marry him?'

'Oh, he has been so good. I have told you—we owe everything to him—I am bound to him by chains—and yet—yet, oh George. I am telling you everything. I am ashamed—yet I must tell some one, because sometimes I think I shall go mad; it weighs me down night and day.'

'Then you must yourself break off your engagement.'

'No, no. I cannot. You forget, George, that we are his dependents, my father and I, both of us. I must do what Robert wishes—all that Robert wishes.'

I groaned.

'And now you know the meaning of the

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cloud. I am only happy when I can forget my own future. And all your kindness is thrown away, because the thought of my own future never leaves me altogether—even with you.'

And then it was that I quite lost my self-control.

'Oh Isabel!' I cried. 'You shall not marry him. Oh! my love—my love—you shall not marry him.'

I took her hands. She cried out and sprang to her feet. I threw my arms round her and kissed her, being carried quite beyond my own control. And I told her in words that I cannot, dare not, set down here for the world to see all that was lying in my heart.

She pushed me from her, and sank back upon the fallen tree on which she had been sitting, and buried her face in her hands.

'Isabel!' I whispered, 'Isabel! if you can love me!'

She gave me her hand. 'Let me hear it once—and say it once, for the first time and the last. Oh George—and I did not know it.'

I kissed her again and again. It makes my heart leap up still only to think of that moment.

Then she stood up. 'It is the first time and the last, George,' she said. 'I am engaged to your cousin Robert.'

'Yes, Isabel.'

'Now we will go home. We will not forget this evening, George. I thank God—yes, I thank God we have told each other. Now I shall feel, whatever happens, that I have been loved—even I, whose promised husband scorns me.' Her voice broke into a sob. 'But we must never, never again speak of it. Never, never. You have loved me for a little, and that is enough for me—to gladden all my life. Even I have been loved—even I'—

I made no reply, because I was fully resolved, you see, somehow to speak of it again. In fact, I felt that it was impossible to consider any other future than one in which the subject would always form the chief topic of conversation.

'Give me your promise, George,' she went on. 'Promise that you will never speak to me of love again.'

'I promise, Isabel, that I will never again speak to you of love until Robert himself has set you free. Will that do?'

(To be continued.)

WANDERING NEEDLES.

It used formerly to be supposed that when a foreign body—no matter what—became lodged in a person's tissues Nature resented its presence, and proceeded at once to do her utmost to cast it off. The means by which she attempted to carry out this purpose was by the formation of an abscess, so it was believed. But the light of modern science has shown that the assumption in this respect was scarcely correct. We now know that Nature is quite complacent in the matter, provided that the foreign body is free from micro-organisms, or to use a technical expression, is 'sterile.' A rusty nail, for example, thrust deep into the sole of the

foot would be quite harmless in its effects were it to contain no micro-organisms on its surface. Again, many bullets have found a resting-place in the bones and tissues of soldiers, where for years and years they have remained without causing harm, merely because they were sterile when they entered the body. Moreover, numerous curious instances could be given of the location of foreign substances in the tissues which, for the same reason, have never caused the least disturbance. Perhaps, however, nothing is more striking in this connection than the wondrous records which exist in regard to needles. In surgery, needles have quite an established reputation for performing marvellous feats in the human body.

Needles display great propensity for travelling when they enter the body. If, for example, an ordinary sewing-needle, or a portion of it, happens to be thrust into, say, the hand, and for some reason no effort is made at the time to extract it, there is no saying when or where the little piece of steel will next be seen. In the majority of cases it starts on a voyage of discovery, which may ultimately prove to be a long course of travelling. In its quiet unobtrusive way it passes along in the substance of the soft tissues without exciting any ill effect. Then after a longer or shorter interval as the case may be, just like a traveller weary of strange scenes and longing to return once more to his native haunts, the needle at length makes its way to the surface of the skin, and when everything concerning it has almost been forgotten, it reappears to the amazement of its host. As it approaches the skin it causes a pricking sensation which leads to its detection. The attendance of the surgeon is required in order to extract it, and as with the traveller who returns with a bronzed complexion after a long journey in a tropical climate, so with the needle. It entered the tissues with its surface polished, bright and reflecting. On the other hand, after its extraction it is seen to have lost all its lustre, is stained, blackened, and more or less rough. But needles do not always travel in the body. Sometimes they appear to be quite satisfied to remain in one spot, namely that at which they originally entered the tissues. In this connection, perhaps, I may refer to the following instance. A young girl of seventeen years of age was admitted into a country infirmary. She came with the history that four years previously she had run a needle into her right knee while kneeling on a hearth-rug. She persisted in this statement, but careful examination altogether failed to detect the slightest indication of the presence of a foreign body. She was, however, so positive in her assertion that pressure on a particular spot over her knee caused her pain and that she could feel the point of the needle, that ultimately the house surgeon was convinced, and he was successful in persuading the visiting surgeon to make an attempt at the removal of the foreign body. Accordingly, under an anæsthetic an incision was made over the tissues of the knee, with the result that nothing could be felt or seen. The incision was made deeper, still without result. At this precise moment another member of the

visiting staff appeared, took in the situation at a glance, hurriedly remarked, 'Take care you don't go into the knee-joint,' and presumably in fear lest he should be present at such a misfortune, precipitately retired from the scene. After, however, the surgeon had been reassured, he divided the tissues still further, and then, at last, lying almost upon the capsule of the joint, in a transverse position, the needle was found, and, with some little difficulty, extracted. The wound healed without a bad symptom, and in the course of a few days the girl left the infirmary quite well. As she was a domestic servant, and had not previously been able to follow her employment in consequence of the needle hurting her when she knelt, it was obvious that the result of the operation from her point of view was eminently satisfactory. The above case is a good example of the difficulties which may arise in connection with the detection of needles which have become located in the tissues.

In one of the medical journals a surgeon recorded some years ago a strange instance of the wanderings of a needle in a lady. The patient called upon him, stating that the greater portion of an ordinary sewing-needle had broken in the first joint of her left thumb. The surgeon could plainly feel the needle point, but after ineffectual attempts at the extraction of the foreign body, he recommended that nothing further should be done, lest the attempts to remove it might result in greater injury to the joint. About a year afterwards, however, the patient called upon him to inform him that a day or two previously she had felt a pricking sensation in the right forefinger, and having broken the skin, she without difficulty extracted the portion of the lost needle from the point of the finger. If all these facts be correct, as reported, the needle travelled from the left thumb along the arm, across the chest to the right arm, and down the latter to the finger where it was extracted.

The following is a well-authenticated case of a similar kind. A man was stabbed in the back of the right shoulder with a hat-pin, such as women use. The pin broke when the blow was inflicted, and only the head with the upper part could subsequently be found. The man suffered no inconvenience from the injury, and this being the case, he thought no more of the matter. However, some months afterwards he suffered a good deal from pain in his right shoulder, and this was ascribed to rheumatism. But no relief followed the treatment adopted, and it was not until some weeks had elapsed that the symptoms entirely passed away. In the course of time he noticed a long hard substance under the skin in the region of the lower part of the breast-bone which puzzled him greatly. Suddenly he chanced to think of the stab with the pin, which he had received about twelve months previously, and then it occurred to him that the hard substance was the missing portion of the pin. He obtained the services of a surgeon, who cut down upon the foreign body and found it to be exactly as the man had supposed. The portion of the pin extracted was two inches and five-eighths in length, and slightly bent in the middle.

Nothing is easier than to explain how it is that needles can travel about in the body and remain there for long periods without the tissues resenting their presence. The explanation is that at the time of their entrance into the body the foreign bodies were free from micro-organisms, that is, sterile. The smooth polished surface of a needle, and the cleanly uses to which the little appliance is put, undoubtedly favour its freedom from microbe contamination. Why the needle should travel by the route it sometimes chooses is less easily explained. The fact that substances introduced in a sterile condition into the body are tolerated by the tissues is one of which surgeons have freely taken advantage. Indeed, a good deal of the success of surgical procedures in the present day depends upon it. One of the most notable instances in which it proves of use is in that relating to the employment of ligatures. Arteries are now tied with sterilised silk, and the ends of the ligature cut off short; of course, silk is a foreign substance which cannot undergo absorption, but no fear need be felt that the ligatures left in a wound will cause any subsequent trouble. Nature surrounds them with newly formed tissue; in other words, they become 'encysted,' and there the matter ends. Again, silver wire is used to unite fragments of bone, as, for example, in cases of fracture of the patella. The wire sutures are allowed to remain *in situ*, and no anxiety need be felt respecting them; they cannot provoke any inflammatory disturbance.

Röntgen's new method of photography—or rather shadow-fixing by means of kathodic rays—promises to be of much use in the detection of wandering needles. In Munich hospital a man was successfully freed, by operation, of a needle which had penetrated one of his hands between the fourth and fifth metacarpal bones, and had previously defied detection. The hand was photographed and the position of the needle was detected. At Queen's Hospital, Birmingham, a woman's swollen hand was photographed, and by the aid of the print a needle was easily discovered, and successfully extracted. Dr McKenzie Davidson, Aberdeen, successfully extracted a needle from the foot of a patient, after its position had also been defined by the new photography.

BILLY BINKS—HERO.

CHAPTER IV.—CONCLUSION.

As soon as he was gone, our little garrison was called to arms, and sentries were posted at every point of vantage. Then came a period of waiting, which was far more difficult to bear than any fighting would have been. About half-past four the enemies' commander came forward to the fence, and demanded that I should at once give up to him the free labourers in my employ. This I refused to do, at the same time allowing him to understand that the first man who set foot inside my fence would be shot without further warning. This firmness on my part had a wholesome effect

upon his followers, and they kept religiously outside, not, however, without threats of what they would do as soon as the main body should arrive. As six o'clock struck, my wife came running to me to say that the store and out-buildings were in flames, and when I heard that, I expected that the kitchen and stable near the house would follow suit. But either from fear of coming within range of our rifles, or because they hoped to be able to utilise them later on, these buildings remained unburnt.

Shortly before seven o'clock one of the hands hastened through the house to where I had stationed myself near my office door, to report that a big cloud of dust was rising on the plain to the eastward, and that he suspected it betokened the approach of the main body. Unfortunately it proved to be exactly what he predicted, and an hour later, the house was surrounded by nearly a hundred men, under the command of one of the most notorious of the Queensland strike leaders.

In language so vile that I cannot reproduce it here, this scoundrel called upon me to bring out and hand over to him the men I was sheltering, assuring me at the same time, with still more blasphemous oaths, that if I did not instantly comply with his request he would set fire to my house and allow every person inside it to perish in the flames. Then came a remark which brought out a cold sweat of fear upon my face.

'You'd best make up your mind pretty soon,' he cried mockingly, 'for there's no police coming to save you. You sent off a boy with a message a while back, but he won't deliver it. If you want him, you'd best go down to the Twenty Mile Creek, where you'll find 'im 'anging by 'is 'eels to a limb of a coolabah just above the crossing. Jim Burns, here, is ridin' his 'orse as you can see for yourself.'

As he spoke, a man rode forward on the very identical horse I had put poor little Billy on to, not more than four hours before. When I saw this, my heart sank like lead within me. If his tale were true, we were indeed at their mercy. But even then I could not give up the men to them, and yet, for the sake of the women in my house, I dared not exasperate them further. To gain time I endeavoured to argue with them. And in the end asked for an hour to consider their leader's proposals.

After a brief consultation with his subordinates, the delegate again rode forward, and said in a loud voice: 'You can have an hour to make up your minds. If you don't 'and 'em over to us then, we'll fire the place without further warning.'

To this speech we made no answer except to prepare ourselves the more earnestly for resistance when the time of grace should have expired. At the end of the hour there was a sudden show of activity; the leader came forward and prepared to address us. But we shall never know what he was going to say, for, just as he was about to speak, a voice in the crowd cried 'Police,' and next moment the entire gang were off across the plain as fast as their

horses' legs could take them. Ten minutes later the troopers were dismounting in front of the veranda, and we were saved.

It was from the Inspector that I learnt the history of Billy's eventful ride.

It would appear that, after jumping the fence opposite the house, he set off due east across the plains at the top of his horse's speed, untouched by the rifle-bullet that the enemy sent after him. As straight as an arrow Billy steered his gallant horse for the bend in the Twenty Mile Creek, where he knew the best ford existed. By taking advantage of this crossing he would avoid a large patch of broken ground, and at the same time save nearly five miles. The creek once behind him, he would be half-way on his journey.

The horse was in splendid fettle, and, with such an atom as Billy upon his back, made nothing of the gallop. Landmark after landmark came into view, ranged up alongside and disappeared into the dark behind him. At the end of the second hour he was within sight of the big timber of the creek. Presently he reached the bank, checked his horse, and began cautiously to descend to the ford. An unpleasant surprise, however, was in store for him. Half-way down the path a black figure rose from behind a bush and seized his reins, while another clutched him from the other side.

'Hullo, young 'un, what's the meaning of this?' asked the man who held his bridle.

'Let me go,' said Billy, with a terrible sinking in his heart. 'I ain't doin' you no harm.'

'No, I'll go bail you ain't,' the man replied with a chuckle. 'But whoever you are, you'll have to come along to the camp and give an account of yourself.'

Thereupon Billy was conducted along the creek to a bit of open ground on the bank, where a camp-fire was burning brightly. A large party of men lay about on blankets spread beneath the trees, while their horses were hobbled within easy reach. Billy's captors gave a shout, and instantly every man was wide awake and eager to be informed where they had found him. As soon as this had been explained, the leader of the party walked over and lifted Billy from his horse.

'Now, young 'un,' said he, 'it will be best for you to tell us what you're up to. Speak the truth, or I'll skin you alive.'

'I ain't afraid of tellin' you,' said the unfortunate Billy, beginning to blubber. 'But I don't see what call you have for to stop me like this. I ain't done you no 'arm.'

'None of your jaw now,' said the man, giving him a vicious shake as he spoke. 'Just tell us what you're doing gallopin' about the country on the boss's thoroughbred like this?'

Astute Billy saw his opportunity, and began to sob with renewed energy.

'If I tell you, you'll go and split,' he moaned, 'an' then I'll be sent to chockee; I know I shall.'

'Well, what have you been up to?'

'I've been and bolted from the station, 'cause I didn't want to be killed,' he wailed, 'an' I couldn't get no other 'orse 'cause they've turned 'em all out. If the boss catches me, he'll murder me; I know he will.'

'You young dog,' said the man, 'you're lying, but I'll soon make you tell. Here boys, build up that fire and give me Dave Garman's green hide.'

The fire was built up with a few twigs, and the long rope was quickly forthcoming.

'Now,' said Billy's tormentor, running the latter through the ring, and slipping the noose over the little fellow's body to tighten it round his ankles. 'You'd best out with it, an' no darned shilly-shallying. Tell me what message the boss sent you with, or I'll hang you head downwards over that fire!'

'I ain't got no message to tell you,' sobbed Billy; 'it's the truth, so help me never.'

The words were hardly out of his mouth before the rope was over a projecting limb, and Billy was swinging by his heels above the fire. But still the little fellow's pluck held out. He no longer cried, however; his anger was thoroughly roused, and in spite of being half suffocated by the smoke, he hurled defiance at his tormentors with all the eloquence of his vituperative little tongue, calling them cowardly dogs, and offering to fight any two of them with one hand tied behind his back, if they'd only let him down. Never for a moment did he dream of purchasing his freedom by betraying the trust which had been reposed in him. And yet the pain must have been excruciating. The men stood round in a group and watched him, though the more soft-hearted cried 'Shame,' and one or two slunk away rather than watch what they considered deliberate murder, but, for the sake of their own cowardly skins, would not attempt to prevent.

Suddenly there was a cry of 'Fire,' and at the same instant flames darted across the grass towards the spot where the various blankets lay. In the face of this new danger Billy was instantly forgotten; every man rushed off to save his goods and chattels before the fire could reach them, and the lad was left alone. Then Billy, who by this time was almost unconscious, heard a voice whisper in his ear: 'Look out, old man, I've fired the grass to save you. I'm going to cut you down.'

An instant later the rope was severed, and a pair of strong arms had caught him, and were bearing him away towards some bushes where a horse stood saddled.

'Get up,' said his unknown friend, placing him in the saddle, 'and be off with you as hard as you can go. You've got our best horse, so don't spare him.'

Without even stopping to say 'Thank you,' Billy seized the reins, pressed home his spurs and started for the opposite bank. Before he could reach it, however, his escape was observed and three men started in pursuit. Seeing that they could not hope to catch him, one of them, noted for his cruelty and his extraordinary marksmanship, picked up a rifle, brought it to his shoulder and fired. There was a shrill little scream, and next moment horse and rider reached the summit and disappeared over the bank.

Once out of sight Billy set his horse going in downright earnest. He knew he had been hit, for he felt a stabbing pain somewhere below his left shoulder, and he could feel the

blood flowing from the wound. But he had no time to think of how it might affect him; he was only conscious that he had lost nearly half an hour, and that he must make up for it at any cost. The horse was a willing beast, and Billy taxed his powers to the uttermost. But with every mile he put behind him he lost more of his strength. His head was swimming terribly, and his left side ached as if it were stabbed in a hundred places. The bushes and coarse Mitchell grass danced and flickered before his eyes, but on he galloped, clinging to the pommel of his saddle, and to his horse's mane when he became too weak to sit upright.

All the time, he told me afterwards, the baby's face was before his eyes, and a voice was ringing in his ears telling him, though he described it to me in other words, that he, Billy Binks, the little ne'er-do-weel and station outcast, had been trusted like a man, and for that reason, even if he died for it, he must carry out what he had set himself to do.

At last, in the gray dawn, after he seemed to have been galloping for years, the roofs of the township appeared in sight on the plain ahead; he roused his horse with a feeble shout, and in less than a quarter of an hour was among the police tents on the outskirts of the town.

The account of his arrival is best told in the Inspector's own words.

'It was about half an hour before daylight when I heard the noise of a horse galloping furiously across the plain towards the tents. Wondering what it might mean, and half expecting a call out, I sprang from my blankets and ran to the tent door. As I lifted the flap I heard the sentry challenge, and next moment a completely exhausted horse pulled up within half-a-dozen paces of where I stood. On its back was that looked, in that light, more like a monkey than the boy it turned out to be. He was hatless and coatless, and was clinging to the mane of his beast, as if he were afraid if he let go he might fall off. Altogether he presented a most curious figure as I went over to him.

"What's the matter, my lad," I asked, taking him by the arm and looking closely at him.

"Unionists at Kalamán," he faltered. "Boss wants you—wants you to come at once, baby—the baby"—

'But he could not manage any more. The pluck that had sustained him so long now deserted him, and, losing his balance, he toppled over and fell unconscious into my arms. Then it was that I discovered he was soaked in blood. Without losing a minute I sent him across to the hospital, after which I called up my men, and in less than a quarter of an hour we were on our way to Kalamán. The rest you know.'

Little as we expected it, this incident proved the end of our trouble, for three days later the Labour leaders declared the strike at an end, and Queensland was free once more. The very instant it was possible, my wife and I, taking the baby with us, drove into Karrabee to see the little lad who had gone through so much to save us.

We found him, as we had been led to expect we should, in the hospital, a dismal, galvanised iron building on the outskirts of the town. His appearance frightened me more than I liked to own, but his delight at seeing us was immense, and, when the baby was brought in and seated beside him on the counterpane, the nurse implored me to cut the interview short, as she feared the excitement would be too much for him.

Before we left I drew the doctor aside and asked him what he thought of the case. He gravely shook his head, and that shake made my heart ache worse than it had ever done before.

'We're going to operate to-morrow,' he said, 'but I'm almost afraid it will be useless.'

His words proved only too prophetic, for two days later, a little before sundown, the life of Billy Binks—a hero if ever there was one—was required of him. Without a murmur, conscious to the last, his hand in mine, the little soul went aloft to receive the reward which it has been promised shall be the portion of those who, at any cost, fulfil the trust reposed in them.

OUR HIGHLAND AND ISLAND BREEDS.

In old-established homes we constantly discover traces of a connection with a foreign land, strange shells from the South Seas, boxes of perfumed sandalwood from the gorgeous East, or maybe a 'moccasin from the Great Lone Land. If we penetrated to the attics of such houses, we would find there, stowed away, furniture of a past date, driven out of the rooms below by newer importations.

Our Highland and Island animals are like these traces of far lands or of ancient lumber. They tell us of other days and races, and of foreign traffic. The dun and gray, long-horned Highland cattle have been driven with their owners out of the fat Lowlands, driven to the attics, as it were. The Duke of Hamilton preserves a few of the ancient Britons at Cadzow; sturdy, determined beasts they are, with somewhat of the build of the Polled Angus about them. These latter, despite their black coats, are reported to be descended from the original cattle of Caledonia, which were said to be white.

Thackeray tells us how when Charles Stuart's niece, Sophia, married Ernest Augustus of Brunswick, she 'brought the reversion to the Crown of the Three Kingdoms in her scanty trousseau.' The English princess, Margaret Tudor, when she crossed the Tweed to be united to James IV., brought along with her ample revenue the future succession to England's Crown. In her day, cattle were used instead of gold, and as part of her dower, her father, Henry VII., presented her with a herd of kine, which were long known as the Falkland breed. The park of Falkland Palace, on the shoulder of the Fife Lomonds, was the royal residence assigned to this four-legged portion of her 'providing,' a palace which to-day bears her monogram cut on its ancient walls. Cattle seemed

to be current coin in those days, for Margaret's great grandson, James I. of England, repaid a loan from his subjects, in the kingdom of Fife, with black cattle. When the hornless race of 'doddies,' now known as Polled Angus, were nearly extinct, the descendants of the Fife or Falkland breeds, Queen Margaret's dower, and King Jamie's repaid borrowings, were sought after and crossed with the remnant of polleys. Samuel Johnson mentions in his famous Scotch tour, 'the black cattle are without horns called by the Scots hummle cows.' They have cousins on the hills of Galloway, but the Aberdeenshires, owing, maybe, to the smoother coats of the Anglified Falkland cows, are a sleeker race than those black skins that live so hardly on the heughs of the Stewartry.

The Shetland sheep and Shetland ponies tell of Norse and Spanish blood. The Fair Isle hosiery, which the natives knit so cunningly and dye such curious colours, are remains of the storm-dispersed Spaniards. The *murid*, or brown sheep, from which the soft wool is obtained, were welcome invaders, whether they came with Spaniards, or, as some say, with Norsemen. At the Edinburgh Exhibition, in 1886, alongside the peculiarly bright caps and jerseys from the Fair Isle, hung a pouch bought by a lady in Valencia market. The colours, and texture of the wools, of the fickle South and the dark North, were identical, verifying the tradition of the Islanders, that the secret of the special dyes was taught them three centuries ago by some survivors of the Armada. The Fethlar Island breed of ponies are said to have a strong strain of Arab blood in them, inherited from the horses cast ashore from the wrecks of our would-be conquerors in 1588. The big-headed, sure-footed steeds of Norway were the original progenitors of the diminutive ponies of the Shetlands. In Iceland, where they were unmixed with Southern blood, they remain to this day clumsy about the head, and wanting in that slim-limbed daintiness which makes the Shetlanders so much sought after. In Wales, the ponies are said to have inherited their dapperness from our earlier conquerors, the Romans, who left their horses behind them. In the Isle of Man, there used to be a breed of Manx ponies (not like the hens and cats peculiar to that unique place—namely, tailless) with a brown stripe down their creamy chestnut backs and a cross of brown on their shoulders. In the west of Ireland, which was also much frequented by the hardy Norsemen, the horses are often so coloured and marked.

The stout assistants to the Stewartry smugglers, the 'Nags of Galloway,' repudiate any Spanish strain. 'They were praised by Froisart two centuries before the building of the Armada,' says a this-century descendant of the hereditary Sheriffs of Galloway. Likely enough the old Manx ponies had a strain of Galloway blood in them, as well as Norse, for the Manx-men and the Stewartry folk had much communing and intercourse, and the 'Nags of Galloway' may, like the Welsh, have had Roman ancestors.

What strange fate or what foreign vessel introduced tailless cats and hens into Manx-land, I know not. Though the cats nowadays may be

manufactured into Manx to suit the inordinate supply of tourists, they used certainly long ago to be, like poets, born, not made. The fowls, now nigh extinct, were a handsome Spanish breed, looking like huge black partridges or guinea-fowls. The Channel Islands boast of very lucrative cattle peculiar to their shores. The small deer-headed dun Jerseys are not allowed to land among their bigger spotted sisters in Guernsey, who have an Ayrshire look about them.

The long-haired Skye terrier, which figured so much in Leech's pictures in *Punch* in the sixties, like to an animated shaggy door-mat, is said to have owed his long hair, as many beasts on the rock-bound shores on the west do, to an infusion of foreign blood from the Spanish castaways. Some poodles from out of the South, dogs of war following their masters, changed the breed of Skyes from a wiry-coated race into a long-haired one. The indigenous black terrier remained untainted by foreign extraction at Dunvegan. This short-legged, hard-haired breed has recently jumped into popularity, and reappeared on the show benches, as an Aberdonian. Spaniels were in fashion in Charles II.'s reign, and bear his name to-day. Blenheim's were Marlborough favourites, but pugs came over from Holland with William and Mary, and ousted the silken darlings from court favour. Dogs, like dynasties, had their day.

Australasia can boast of its moas, emus, and other 'living fossils' among its indigenous livestock; but the Mother-land has, stowed away in odd corners of her small domain, unique animals left by invaders, introduced by refugees, or brought from afar by her restless exploring sons, by means of which we can trace curious small waifs and strays of the history of this United Kingdom.

THE MONTH:

SCIENCE AND ARTS.

THE Corporation of Swansea are about to adopt a triple electric scheme, which, when carried out, will probably be regarded as a pattern for all other local authorities to copy. This scheme aims at destruction of town refuse, the production of electric light, and tram-car propulsion by one operation. Its very audacity is enough to startle those who have become used to old jog-trot methods of municipal administration; yet there is nothing utopian about the enterprise, bold as it is in conception, and it has the favourable opinion of no less an authority than Mr Preece. According to this well-known electrician, Swansea is in a fair way of becoming a pioneer town, and, to quote his words, 'Its finances would be improved by the profits that would arise from the successful administration of those purely local and municipal industries which the legislation has decreed should be in the hands or under the control of the rate-payers themselves.'

Among the arts to which more attention was

given in past times than in the present, is that of bookbinding, the finest examples of which are the product of this country, Holland ranking next in the variety of its book coverings. The subject was dealt with in a lecture recently given in London by Mr C. Davenport of the British Museum, who, in enumerating the principal substances used in English book-binding, said that although leather was the chief material employed, many examples could be found of the use of silk, velvet, and other materials. In the middle ages, books were either very rich or very poor in their bindings, and during the Tudor period some very beautiful binding in velvet was executed, which might be compared in excellence with the wonderful goldsmith's work which preceded it. Laws had been passed to protect native binding from foreign competition, but in reality England had, as in other trades, gained by the invasion of foreigners, who brought with them fresh ideas, and were often men of taste and talent. The lecture was illustrated by a large number of coloured lantern slides, exhibiting the various styles of bookbinding peculiar to different countries and periods.

The Argentine Republic is now competing with Denmark, Sweden, France, and other countries as a producer of butter for the British market, and it would appear that the country is admirably adapted for such an industry. With abundant pasture land, and Gauchos to act as herdsmen to the cattle, the supply of milk is regular and abundant, although it is not so rich in butter fat as the product of Denmark, for example. The milk is conveyed to the butter factories, of which already there are no fewer than thirty fitted with the latest machinery, which we may mention is made in Britain and admitted free of duty by the Argentine Government. In these factories all the work is done by Europeans, mostly Italians and Basques from the south of France, who take readily to the dairy business, and are content with a wage of one shilling per day.

Another still more important new source of food-supply is represented by Canadian salmon, a first consignment of which has recently reached the London market. Tinned salmon we have had from Canada for many years, but the recent importation is of whole salmon brought over in refrigerator chambers like colonial mutton. It is well known that the Canadian rivers are well stocked with fish; so plentiful indeed are they that a halfpenny a pound for salmon is a common price in many of the towns. It remains to be seen whether the fish can be sent the enormous distance of eighteen thousand miles in a frozen condition without deterioration, and can be sold at such a price as to tempt purchasers who are ordinarily forced to regard salmon as a delicacy beyond their means. It is believed that when the new industry is thoroughly established, Canadian salmon in first-class condition will be sold in the principal English markets, and eagerly bought at about sixpence per pound.

This is not quite so cheap as the tinned fish, but there is a certain amount of prejudice against the latter, justified to some extent by reported cases of serious illness traceable to that method of preparation, which would always give a casting-vote in favour of the frozen variety. It must be remembered too, risk of illness apart, that tinned goods are more or less spoilt by the over-heating to which they are subjected.

Our national picture-galleries and museums have recently been exceedingly fortunate in the acquisition of valuable private collections, one of the most noticeable of these gifts being the important collection of birds left to the natural history branch of the British Museum by the late Mr Henry Seebohm. This gentleman had been during his life a generous donor to the same institution, constantly enriching its stores by some specimen in which it was deficient; but the bequest to the nation authorised by his will is of a far more important character, embracing as it does many historical collections which the energy and ample means of the testator had acquired. Among these may be noted Swinhoe's Chinese birds, Pryer's Japanese birds, and Anderson's Indian birds; but Mr Seebohm himself had been an industrious worker, and has been able to bequeath to the museum an example of nearly every known species of game bird, the finest collection of thrushes ever brought together, and nearly fifteen hundred skins of wading birds. This last series of specimens were those which furnished him with data for his great work on the geographical distribution of this group of birds.

The National Society for checking the abuse of public advertising has been organising a conference which was recently held at the Society of Arts, London. We have before in these columns alluded to the aims of this useful society, the principal one of which is to stop the defacement of rural scenery by the exhibition of gaudy posters, and the advertisement of proprietary medicines, &c. along our hedgerows. Such a movement must have the sympathy of every one who has an eye for the beauties of Nature, and the willing support which numerous artists, including the late lamented president of the Royal Academy, have given to the movement, gives some promise of ultimate success in stopping the evils complained of. We trust that the rural advertisement bill, when next presented to Parliament, may meet with the cordial support which it deserves.

For a long time it has been asserted that the British farming industry is unduly handicapped by the railway companies giving better terms to the foreign producer. The statement has in reality no foundation in fact, the truth being that the foreign farmers combine together and send large consignments by rail, while the native farmer is content to send small quantities, which are naturally subject to higher charges. For it stands to reason that a railway can run a ten-ton truck at a cheaper rate proportionately if it be full, than if it carry only a few hundredweight. But the Great Western Railway Company are now meeting English farmers in the most generous spirit, not only offer-

ing them favourable terms if they send their goods in sufficient quantities, but actually undertaking the collecting, transport, and consignment of the produce. To put it briefly, they will call at the farm for the goods, and when disposed of, will give the farmer a cheque for the amount due, less their own charges. Strange to say, the English farmer does not seem to appreciate this new policy on the part of the railway company, inquiries showing that he does not care to move from the customary groove, and is too jealous to co-operate with his neighbours. But he certainly can no longer complain with any reason of foreign competition. We may mention that the new departure is mainly due to the foresight of Viscount Emlyn, chairman of the Great Western Railway, who is a prominent member of the Royal Agricultural Society of England.

It has long been the complaint of artists who draw for our illustrated periodicals that much of the beauty of their work is lost in its translation to a form suitable for the printing-press. And although this is not such a crying evil as in pre-photographic days, when it was in the power of an engraver to hack a fine drawing into a very poor woodcut, the artists have still a good case. Professor Herkomer has recently introduced a method by which the artist himself has the ultimate fate of his work more under his own control. On a polished and silvered copper plate the artist makes his picture with a special kind of black pigment, using brush, dabber, stump, finger, or any tool which will produce the effect desired. The lightest shades naturally carry the least pigment, while in the deep shadows the paint is thick. The drawing is now powdered over with some body, like graphite, which forms a conducting surface, the finer particles attaching themselves to the lighter tones, and the coarser ones to where the pigment on the plate is at its thickest. This done, the plate is put in an electrotyping bath, and in course of time an intaglio plate is formed which can be printed from in the copper-plate press. The process, which it will be seen is not adapted for the typographic press, bears a strong resemblance to one introduced more than forty years ago.

We are extremely glad to record that the Dundee whaler *Active* last season had a most prosperous time, and that her owners made the largest profit realised in Dundee for the past two or three decades. The Greenland whale-fishery was the scene of action, and besides nine whales, a number of narwhals, seals, &c. were killed, the whales being estimated to produce four and a half tons of bone. After paying the cost of the outfit of the vessel, and meeting all the expenses of the trip, the lucky shareholders will receive a dividend of three hundred and sixty per cent.—which we should think is about as far beyond 'the dreams of avarice' as shareholders in any enterprise have yet gone. Some of the whalebone, we may mention, has been sold at the rate of two thousand pounds per ton.

A very valuable warning to householders was conveyed in a recent lecture by Dr W. H. Corfield, the medical officer of health, St George's, Hanover Square, London. The subject of his discourse was 'Defective Drains and

Sewer Air as Causes of Disease,' and cases were described which had come under the personal notice of the lecturer, in which disease had been directly attributable to the escape of sewer air into the dwelling-house. The most common symptom of mischief was sore throat, and if this did not appear, the members of a household breathing contaminated air suffered from 'general malaise.' It was mentioned incidentally that workmen employed in mending defective drains very commonly suffered from sore throat, and that an escape of coal-gas sometimes led to the same result. Diphtheria had been attributed to the presence of sewer air, and although this had not been proved, it was the fact that contaminated air was commonly found in houses where the disease appeared: it was fair to assume that sore throats caused by defective drains would make persons peculiarly liable to contract that complaint. Blood-poisoning and pneumonia were also occasionally produced by breathing bad air, and in infancy diarrhoea could often be traced to the same exciting cause. Typhoid fever, although mostly propagated by bad water, was also frequently spread by foul air, and instances were adduced in support of the statements.

Another paper recently read before the Liverpool Polytechnic Society, by Mr James Hargreaves, F.C.S., on sewage and zymotic poisons, contained some practical suggestions which are well worthy the attention of all sanitary authorities. Mr Hargreaves also assumes that zymotic disease is principally caused by sewer gas, which in many cases cannot be detected by its odour. He proposes to give it an unmistakable scent, and at the same time to kill all obnoxious organisms in the sewers, by pumping therein chlorine gas. This gas can be readily made by the decomposition of common salt, with the help of an electric-lighting plant, which can be run at light expense, being unoccupied in the daytime. Soda crystals would be formed as a by-product, and in large installations its sale would cover all cost of making the chlorine. Engineers may very possibly find objections to the process which are not apparent on the surface: we merely give a brief outline of the method for their consideration.

The often-discussed scheme for supplying London with a sea-water service is once more revived, and a bill to forward the enterprise will come before Parliament during the ensuing session. The idea is to obtain the water from Lancing, near Worthing, in Sussex, and to convey it by conduits to the metropolis, the cost being estimated at £450,000, and the time of construction two years. In a paper upon the subject read recently before the Society of Arts by Mr F. Grierson, many advantages were claimed for the enterprise. First comes the question of health and the great good accruing to invalids and others by sea-bathing. Then we are told that for street cleansing and watering, sea-water possesses many advantages over fresh, and that great economy would ensue from its use, forty million gallons of filtered fresh water being daily used in London for that and other non-domestic purposes. If it be true that twenty-five per cent. of the fresh water at present used by Londoners would be

saved if sea-water were at hand, it would seem that we have here a potent argument in favour of the scheme. It may be mentioned here that powers were actually obtained from Parliament a few years ago to promote a similar scheme, but the matter was allowed to lapse, either from want of support, or because the promoters found out too late that their plans were drawn on too narrow a basis.

The author of the articles on Apple, Gooseberry, and Strawberry culture, which aroused much attention and interest on their appearance in this *Journal*, has just issued a little practical manual of *Cottage Gardening* (W. & R. Chambers, Ltd.). The author, a gentleman of great experience, who has long cultivated flowers, fruits, and vegetables with exceptional success, supplies just the kind of information necessary to instruct the amateur how he may best manage his garden, while the book is written in an eminently readable and interesting style.

Nearly a year ago, a committee was appointed by the Board of Trade 'to inquire into the extent to which goods made in foreign prisons were imported into this country, and to report whether any, and if so, what steps can be taken effectually to restrict the importation of such goods.' This committee, after hearing a mass of evidence, has now made its report, and it is satisfactory to find that the various allegations which led to its appointment had very little foundation in fact. It seems that only two trades, the brushmakers and matmakers, have made serious complaint of injury—and such complaints are confined to Belgian and German goods. These goods, the committee assert, are not imported in such quantities as to affect British trade generally. In both the trades named the injury is but slight, and affects only the cheapest class of goods. Brushes can, in fact, be made more cheaply by machinery in Britain than they can be made abroad by prison labour, and the trade is on the increase. Any steps to restrict the importation of prison-made goods would, the committee think, be productive of more harm than good. It would therefore seem that this committee have been set to work at the discovery of what is commonly known as a mare's nest.

'Every bullet has its billet,' says the proverb, but experience proves that happily the billet is not so often the human body as might be expected. The common estimate has been that on the field of battle one man falls for every hundred shots fired, but this waste of lead seems to have been much exceeded in the recent unfortunate skirmish in the Transvaal. A correspondent in the *Times* alludes to this in a letter headed 'Boer Marksmanship,' upon the boasted accuracy of which he throws grave doubts. The Boers, it will be remembered, numbered fifteen hundred men, and they were practically in ambush, waiting to attack a force one-third the strength of their own, consisting of utterly worn-out men incapable of much resistance. They each had forty rounds of ammunition, and were supplied with more during the thirty-six hours' fight. Supposing, however, they only used the forty shots per man, this would amount in the aggregate to sixty thousand bullets fired, with the result of

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sixty-eight casualties—the total number of killed and wounded. For every man knocked over there were therefore nearly nine hundred bullets sent astray, to say nothing of the Maxim and artillery fire. Had the Boers been the expert marksmen they have been supposed to be, not a single member of Dr Jameson's band would have escaped without a wound.

The explosion of an aërolite is an occurrence which is so seldom witnessed, that the recent event reported from Madrid has naturally excited great interest. It was literally 'a bolt from the blue,' for the sun was shining at the time when the strange visitant made its appearance. It is, however, fair to assume that such things are far less rare than is commonly supposed; for when we consider that four-fifths of the globe is covered with ocean, and that the remaining fifth presents vast tracts of unoccupied country, it must be evident that meteoric stones might find many a resting-place on the earth without the cognisance of a single human being. Our museums contain many specimens of solid matter, weighing from a few ounces to as many tons, which have come from space. But it is known from the presence of meteoric dust on the surface of the highest snow, where dust of the ordinary kind is impossible, that these visitants are generally dissipated in that form when they enter our atmosphere.

'WHY I ENLISTED.'

A REMINISCENCE.

By W. FORBES MITCHELL,
Author of Reminiscences of the Great Mutiny.

I AM a Scotchman from north of the Grampians, a descendant of one of the oldest Jacobite families of the memorable 1745, who risked and lost all for the House of Stuart and 'Bonnie Prince Charlie.' My great-grandfather fell at Culloden, and my grandfather was one of those for whose capture a heavy reward was offered in 1746. My father was born at Florence in 1769, and died at the age of one hundred and three in 1872—having been presented to Prince Charles Edward as titular King of England some time before his death. It will thus be seen that I belong to only the second generation from 'Prince Charlie.'

In the days when I was young, whisky-distilling was a lucrative business, and towards the end of the first half of the present century I was apprenticed to learn its mysteries in one of the largest distilleries of the Highlands. Full of hope and a determination to work and become a master of my business, I entered on my apprenticeship, and was placed under the orders of a worthy old Highlander named Donald Macpherson, who was a relation of Cluny, the chief of the clan, but filled the post of head-brewer (a distiller in Scotland is called a brewer) and general superintendent of the distillery. Among the first lessons which Donald taught me was that it was not by any means a sin, but rather a meritorious act, to cheat the excisemen in every possible way.

I must now pass to about the year 1853, when the harvest proved to be unusually late

in the Highlands, and there was a deal of mildewed or damaged barley. My readers will understand that malt made from such barley is inferior to that made from sound barley, and if used for brewing beer, it gives the liquor a disagreeable musty flavour. But this defect can be corrected to a large extent if a little powdered sulphur is thrown into the kiln fire when malt of this sort is being dried. I should explain that malt in the Highlands is dried on a perforated kiln over the fire, and the smoke passes up through the grain. This is what imparts to Scotch whisky its peculiar smoky flavour. At the time of which I write there was a heavy duty on malt, as well as on spirits, and the operations of malting were entirely separate from those of distilling or brewing. Besides, the excise officers were most particular, some of them annoyingly so, in gauging all raw barley put into the steep for malting, and again during the operations of malting, and when the malt was being dried on the kiln. But in spite of all their watchfulness, a few quarters of extra barley would occasionally pass over the kiln. About this time a new preventive officer joined the excise staff of our distillery, direct from England. This man took up the place of the most obliging gauger whom we had, and he soon showed himself to be more troublesome than any member of the excise staff who had been in the district for many years. In consequence, he was thoroughly hated, not only by the men employed in the distillery, but by his own fellow-servants of the Government; it being firmly believed that he had been sent as a spy on them as well as on the servants of the distillery. To add (if that were possible) to his other evil qualities in the eyes of distillers and gaugers, he was a strict teetotaler, and went by the nickname of 'Water Willie.' If any one hated Water Willie more than another, that man was old Donald Macpherson, who openly declared his belief that Water Willie was no other than a certain 'Gauger Gillespie risen from the dead.' The said Gillespie was a supervisor of the excise staff, highly unpopular throughout the north country, and hanged at Aberdeen.

However, if Water Willie watched the distillery staff closely, he was as well watched in return; and for months he was held at defiance and unable to even hint that anything was wrong. But a few days before Christmas he tried a *ruse*, by giving out that he had been invited to spend Christmas-eve with the family of an English gentleman residing some miles from the distillery; and this being believed, several quarters of extra barley were secretly malted and ready to be kiln-dried before the appointed evening. Late in the afternoon, the day before Christmas, Water Willie gauged the malt on the kiln and that in the malt loft ready to be dried, and sent in his daily report to his superior, apparently satisfied that everything was as it ought to be. After submitting his report, Water Willie dressed and left the premises, wishing every one, myself amongst the number, a hearty good-night and a merry Christmas. That evening it was my turn to take charge of the kiln, and in consequence of a few quarters of extra malt being on it that

had never been dipped by Water Willie's gauging-rod, I was keeping up a brisk fire. Towards eight o'clock I was about to lower the fire to clear the kiln when a boy, whom I had placed as an outlook, rushed in with the information that Water Willie was not only in the distillery, but that he was actually on the kiln dipping the malt with his gauging-rod. I was almost dumbfounded, but did not lose my presence of mind; I listened, and sure enough I heard some one stealthily moving about on the kiln above. What to do I did not very clearly know, but one thing I was certain of—the fine on the proprietor would not be less than £500, and the confiscation of all the malt on the kiln. And the hated Water Willie would get half of the total!

In my perplexity I glanced round, and my eye lighted on a small barrel of finely powdered sulphur, meant to be used in the case of mildewed barley. The only thing I thought of was my duty to the distillery. I did not for a moment think of the danger to the life of Water Willie. I could only think of the fine on the proprietor and the disgrace to all concerned in being outmanœuvred and caught by such a contemptible opponent. I seized the shovel in the barrel and threw a shovelful of the brimstone on the fire, not with the intention of suffocating or killing the gauger, but in the hope that the fumes of the sulphur would drive him off the kiln before he had time to fully gauge the malt on it. My pungent remedy was, however, more deadly than I intended, owing to the fierce fire which I was still keeping up. I had hardly thrown the sulphur on it than, to my horror, I heard a heavy body fall overhead. Rushing up to the kiln, I found the sulphur fumes so powerful that it would have been courting suspended animation, not to say death, to have entered on it. Fortunately there was a barn-yard pitchfork with a long handle near; so seizing this, in a moment I had inserted the prongs of it behind the hinges of the door, and bent them like a double boat-hook. With this I hooked Water Willie by the clothes, and with the assistance of the boy dragged his insensible body to the open air. I then sent the boy flying for my trusty friend and mentor, Donald Macpherson, who, to use a police phrase, 'was immediately on the spot.' Donald, as soon as he heard the word 'sulphur,' took in the whole situation at a glance; he at once stretched out the insensible gauger, opening out his collar and chest; and ascertaining that his heart still beat, he gave a grunt of satisfaction in Gaelic, and then gave orders for the immediate clearance and safe custody of the extra malt on the kiln.

These orders having been given to trusty subordinates, Donald turned his attention to the fumigated gauger, who still showed little appearance of returning to his senses. But luck was still in our favour. The village doctor had been dining with the proprietor, and had not left the house. Donald called the master and speedily informed him of the whole catastrophe. He in turn informed the doctor, and the still insensible gauger was soon consigned to his care and that of the mistress

and female servants of the house. Donald regretfully hinted to the maid-servants that Willie had been at a party and broken his pledge. As if to confirm this view of the case, about a gill of whisky had been poured down Willie's throat, and his clothes well saturated with it, in the hopes of reviving him, so the idea was apparently converted into a fact beyond dispute. Matters having been thus arranged, the proprietor had time to learn how it had all come about, and my friend Donald told him with many emphatic ejaculations that, by my prompt action, I had saved both the honour of the distillery and the master's purse. He further swore in classic Gaelic—Donald always spoke in Gaelic when excited, English being too vulgar to express his meaning—that I was a rare boy, and would certainly become a distiller of renown, and would be—'Transported if not hanged,' broke in the proprietor in vulgar English; 'and the sooner he is out of the Glen the safer it will be for himself and all concerned.'

Donald tried to reason with the master to get him to change his opinion, arguing that all that was necessary was for every one about the distillery to maintain that Water Willie had gone away and returned drunk. But the master reasoned in return that such a course was impossible; that although the doctor with his wonted friendliness would assist as far as he could, still this case might have to go before a court of law, and he knew the good old doctor would not perjure himself for the value of all the whisky in the cellars of the distillery. Although the ill-used man was slowly coming round, he was by no means out of danger; and the master was confident that after the gauger came to his senses and remembered the facts, his word would be taken by the Inland Revenue authorities at Somerset House against the oaths of the whole population of the neighbourhood. It was therefore necessary that I should be turned out into the wilderness of the world, as the scapegoat for the sins of the distillery as well as my own.

My carpet-bag was soon packed, and I was instructed to make my way to the good city of Aberdeen, not by the direct route, but by crossing the mountains—no easy matter at that season of the year—to a roadside inn about sixty miles from the Glen, where I could wait for the stage-coach carrying the Royal Mail from the Central Highlands to Aberdeen. So with ten pounds in my pocket, and my carpet-bag on Donald's back, I started, and on the evening of the second day I reached the inn where I was to take the stage-coach. At 10 A.M., the third day from my adventure, I was an outside passenger by the 'Earl of Fife,' on my way to Aberdeen at the speed of ten miles an hour; and before night I was safely lodged in Dee Street in the house of a certain Janet Gordon, an aunt of my former master. Here I remained quietly for ten days.

At this juncture a letter came to Janet, informing her that Water Willie had fully recovered and had sent a special report to the authorities of Somerset House of the dastardly attempt on his life. An official of high position and experience in the Inland Revenue

department had been sent from London to thoroughly investigate the matter, and the local police had been directed to produce the young man who was in charge of the kiln the night that Water Willie was fumigated. This information was accompanied by £50 in £5 Bank of England notes, with the intimation that the next mail would bring a description of me to the police authorities of Aberdeen, so that it would consequently be prudent for me to visit a maternal uncle in France, till I should receive further instructions. The next morning I had secured a cabin on board the s.s. *City of Aberdeen*, and was on my way to London, intending to go thence to Dover and cross to France. I was not by any means joyful at the prospect before me. I had before this spent several years of my early life with this uncle, and although I was really fond of the old man and was much liked by him in return, still there was a *but* in the question. My uncle was married to a French lady, and although they had no children of their own, my aunt-in-law had a number of poor relations. Naturally, I was no favourite with either her or them; I was looked on as a dangerous interloper who might be remembered in my uncle's will. Consequently I did not relish the prospect before me. Whilst brooding over my prospects, promenading the deck of the steamer, I being almost the only first-class passenger, I espied a sergeant of the 93d Sutherland Highlanders returning from Inverness, where he had been on furlough, to join the depot of the 93d in the Isle of Wight. I made up to the sergeant, who was pacing the deck in the clear moonlight, and got into conversation with him as to the prospects of a war with Russia, the 93d having lately embarked at Plymouth for Malta as the advance guard of the future army of the Crimea. The gallant sergeant entertained me with a full and complete history of that glorious regiment the 93d Sutherland Highlanders, at that time the most thoroughly Scottish, and by far the most Highland of all the Highland regiments. They had over seven hundred men in the ranks who could speak Gaelic—and of those at least three hundred and fifty were the younger sons of Highland gentlemen, serving a short apprenticeship to qualify them for commissions in the Guards or the other famous corps of the army. He concluded by reciting an address by General Sir Harry Smith to the troops before embarkation.

Having drunk the sergeant's health and that of his gallant comrades, I told him that I had made up my mind to enlist. He at once produced a shilling—or rather he borrowed one from myself, assuring me that if I would condescend to receive it back in the Queen's name (God bless her!), I would be captain of a company before twelve months. I took back the shilling in all good faith, and the next day, on reaching London, I was brought before a magistrate and was attested, having first passed a medical inspection by a recruiting surgeon.

The following day the recruiting officer in London, taking advantage of the return of the sergeant of the 93d to the Isle of Wight, determined to forward a large batch of recruits under his charge to Portsmouth for the artillery

and different corps in the Portsmouth garrison. So the next day we were marched to the railway station, and put into the train under the usual passage warrants for the transport of recruits. But it turned out that the train was rather crowded, and there was barely room in the third class for the whole batch. Meanwhile, as they were being packed in, an old gentleman of a military appearance, to whom I noticed the recruiting officer gave a most respectful military salute, walked along the platform taking the measure of each recruit as he passed. When he came to where I stood, with my Highland plaid around my shoulders and my carpet-bag in one hand and portmanteau in the other, he surveyed me from head to foot, and turning to the recruiting officer, asked if I was also a recruit. Being answered in the affirmative, and that I was for the 93d Highlanders in Parkhurst Barracks, he turned to a young gentleman, also in plain clothes, and said, 'Take him to our carriage.' So I was provided with a seat in a reserved first-class compartment, and before I had time to thank my courteous patron, or to think of my good luck, the train moved off. There were only four of us in the carriage, the old gentleman and two young ones, both of military appearance, but in plain travelling clothes, and one had charge of a well-filled luncheon basket.

Shortly after the train moved out of the station, my patron entered into conversation with me. On his asking me where I had enlisted and so forth, I told him that it was on board the Aberdeen steamer in coming from the north to London. He also asked if I had any objection to tell him what had led me to take this step, because I did not appear to be of the ordinary class of recruits. After pledging the party to secrecy, I gave a brief history of my escapade with Water Willie, and all three seemed to enjoy the history vastly. The old gentleman laughed till he had to hold his sides, and then congratulated me on the lucky circumstance, that Water Willie had only been fumigated and not suffocated. This led up to the history of my meeting with the sergeant of the 93d and my enlistment. Warming to my subject, I recited the whole of the sergeant's story as to the superior class of men in the 93d, and wound up with the address of General Sir Harry Smith to the regiment before their embarkation. The old gentleman roared with merriment, the tears running out of his eyes, and as soon as he could speak he shouted: 'Another such story will be the death of me.' Thus the time passed, and as the train sped along we were well supplied with refreshments from the luncheon basket—which, I need hardly say, I heartily enjoyed, for I had not eaten anything before leaving the recruiting rendezvous.

As we were nearing Portsmouth the old gentleman gave me some pieces of practical advice more in fun than in earnest. The preface to his advice was: 'Youngster, if you are not hanged or shot, you will yet cut some figure in the world or I'm much mistaken.' He then went on: 'When you join your regiment, always do what you are ordered to do, but

never volunteer for anything.' To this I replied that I had always understood that it was considered the correct thing in the army for soldiers to volunteer for a 'forlorn hope.' To this he replied: 'Yes, it may be considered the correct thing to volunteer for a forlorn hope, but don't you do it, unless under very exceptional circumstances, because the chances are a hundred to one that you may get knocked on the head, and even if you are lucky enough to escape with a whole skin, the chances are you will gain more ill-will than thanks for your pains.' The next advice was: 'Never ask a favour from the colour-sergeant of your company when you can go to the captain.' And as he helped himself from a bottle of excellent claret in the luncheon basket, he said: 'When you rise a bit in the world, as I'm sure you will do, always barring you are not hanged or shot, if it ever happens that you are at the saloon-table travelling on a passenger steamer, watch both the dishes and the bottle from which the skipper helps himself. Be sure you eat and drink from the same, and, as a rule, you will be sailing on the right tack and will reach port in safety.'

Shortly afterwards the train reached Portsmouth, and before leaving the carriage to join the other recruits, I asked the name of my affable patron; in reply he presented me with a visiting-card, telling me to take it to the captain of the depot, and 'tell him that it is my request that you may be sent to join headquarters of the 93d by the first draft.' On this he disappeared in the crowd, and I made my way to the nearest lamp-post to read the name on the card. The reader may judge of my surprise when I read thereon, 'Lieutenant-general Sir Harry Smith.'

We duly reached Parkhurst Barracks at about 10 p.m., and I was accommodated in a room which contained about twenty men, mostly recruits, with a few old hands to coach the young ones in barrack-room discipline. One of the old soldiers, named John McDonald the fourth—there being three others of the same name in the company—slept in the next bed to me, and as soon as the pipers played the *reveille* next morning, John showed me how to fold up my bedding in proper order, and to make everything tidy for the inspection of the orderly officer.

Long afterwards I heard the result of Water Willie's report to Somerset House. In that report he committed an error of judgment in including the name of his supervisor, who was accused of being hand and glove with the proprietor of the distillery in endeavouring to cheat the excise. For this he was put on trial, when the distiller and supervisor were exonerated; but Water Willie was found guilty of certain irregularities in this and former reports, for which he was dismissed from the service. Twenty years after these events I met Water Willie serving as a convict in one of our Indian jails. He began a downward career by embezzling the funds of a Regimental Temperance Society, while employed as an army Scripture reader, and afterwards swindled several shopkeepers and jewellers in Calcutta. He was sentenced to five years' rigorous imprisonment

by the High Court of Calcutta, and so far as I know, the end of his career was that he was deported from India as a vagrant about 1875. I heard afterwards that he was employed by the Italian Government at Brindisi, during one of our periodic cholera scares, fumigating all passengers from Indian ports passing through Italy, as a precaution to prevent the spread of Indian cholera to Europe, and here for the present endeth the history of Water Willie and why I enlisted.

ONE HEART.

I SOMETIMES linger o'er the list
Of friends I lost in other days,
And still the question with me stays—
'When I am gone shall I be missed?'

I doubt if others think the same,
Or even wish to share my thought—
That men were foolish who have sought
To leave a never-dying name.

When thou hast run thine earthly race,
Thou wilt not 'leave a world in tears,'
Nor will men come in after years
To view thine earthly resting-place.

Thy poor remains will rest as well,
Thy spirit will be no less free,
Although it is not thine to be
A Milton or a Raphael.

Fret not thyself but Heaven thank
If all the good that thou canst do,
May be so done that only few
Need ever know thy place is blank.

Be thankful if but one true heart
Shall feel for thee the moment's pain—
Ere it can say 'we meet again'—
Of knowing what it is to part.

One loving heart thou mayest crave,
Lest all thou caredst for on earth
Should seem to have no lasting worth
And end for ever in the grave.

One faithful heart beneath the sky,
In which to leave a seed of love,
To blossom in a world above
And bear a fruit which shall not die.

C. J. BODEN.

* * TO CONTRIBUTORS.

- 1st. All communications should be addressed to the 'Editor, 339 High Street, Edinburgh.'
- 2d. For its return in case of ineligibility, postage-stamps should accompany every manuscript.
- 3d. To secure their safe return if ineligible, ALL MANUSCRIPTS, whether accompanied by a letter of advice or otherwise, should have the writer's Name and Address written upon them IN FULL.
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